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COMMONWEALTH PHYTOPATHOLOGICAL NEWS

A QUARTERLY REVIEW OF NEWS AND VIEWS ISSUED BY THE COMMONWEALTH MYCOLOGICAL INSTITUTE, KEW, SURREY

MAIN ITEMS

SPRAY TECHNIQUES
WHEAT RUST CONFERENCE
UNSOUNDNESS IN SAL
PERSONAL NEWS
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C.M.I. ADVISORY VISITS
NEW LABORATORY AT ROTHAMSTED

SPRAY TECHNIQUES: COVERAGE OF THE TARGET

During the last world war considerable advances were made in the method of application of insecticides and fungicides, using large volumes of spray by means of high pressure pumps. After the war the cost of labour increased considerably, and on plantation crops such as apples and pears hand spraying with lances was extensively replaced by various types of automatic equipment. This resulted in an economy of labour and speeded up the work, but the cost of equipment and materials remained high.

Such a technique aims at as complete a coverage as possible of the whole target, consisting of bark, stems, both sides of leaves, fruit, etc., a procedure that requires the application of large volumes of spray with considerable quantities running off on to the ground. Despite the high pressures and large volumes of spray used it often proves most difficult to achieve adequate coverage on inaccessible portions of the target such as opening buds and underside of leaves.

The post-war development of several highly effective synthetic insecticides made it possible to achieve high control of many pests with a considerably reduced need for uniformity of distribution of the spray material. For example, capsid bugs are readily killed by running about on bark and leaf surfaces, where they soon pick up a lethal dose of DDT. On the other hand, with protective fungicides the need for uniform distribution of effective amounts still remains necessary. There is little data available on the amounts and distribution of fungicides required per unit area of the target to ensure satisfactory control under field conditions, and it is the absence of this essential information that makes it necessary to assess the efficiency of a spray application by biological observations; a procedure cumbersome compared to the speed and accuracy of chemical assay.

It has been evident since the very early days of spraying when fine 'mist' spraying with lances was advocated that very small amounts of fungicide could secure control. The practical difficulties of efficient mist spraying under commercial conditions made it impossible to obtain satisfactory results, and therefore full coverage spraying at high pressure was gradually accepted as the most effective method of application. The excellent results obtained with the synthetic

A multi-purpose tractor-drawn and-driven mist blower

A mobile observation platform for the observation and collection of spray deposits

organic insecticides led, however, to a renewed interest in applying them as mist sprays, but the difficulty of propelling and distributing small droplets through vegetation still remained.

This led to the development of airflow mist-blowers in which the droplets were propelled to, and in some cases through, the target in an air stream. The distribution of the droplets on the target are often most uneven, the extent of the lack of uniformity depending on a number of factors such as droplet size, volume of the air vehicle, lay-out and nature of the "make up" of the crop. The results of mist spraying of the organic insecticides have been in many cases spectacularly successful and this had led to the assumption that equally good results should be obtained with fungicides. Unfortunately, this has not proved so, for example, with apple scab when the liability to infection has been very high. This can be explained almost entirely by the difficulty of securing adequate uniformity of distribution of the fungicide.

The lack of data on the amounts of fungicide required on the target has led to the practice of assuming that the amount of material normally applied per acre by means of full coverage (high volume) spraying shall be applied in whatever reduced volume is applied as mist spray. This is sometimes referred to as 'concentrate spraying'. It would appear from field trials that this assumption of the need for using a more concentrated spray because the volume is reduced is not necessarily correct, for example, when the reduction of the volume is of the order of 400 to 100 gallons per acre. The results suggest in this case that the normal strength of fungicide is adequate and the reduction in droplet size has reduced run off.

It is often assumed that a reduction in droplet size automatically results in adequate coverage, with a great reduction in the volume of spray used. This is far from correct and one of the outstanding faults with mist blowers is the difficulty of securing deposition on the vulnerable portions of the target. The difficulty varies considerably with the crop, the type of machine, and the climatic conditions

prevailing at the time of application etc. It is these factors that account for the widely differing results obtained by various workers.

There is no doubt that application by mist blowers has many outstanding advantages, but it is clearly evident that the successful development of this technique of application will depend largely on the progress made in our knowledge of what is required to be deposited on the target, together with a much better knowledge of the behaviour of air-borne droplets under field conditions of application.

Long Ashton Research Station, H. G. H. Kearns
Bristol.

THIRD INTERNATIONAL WHEAT RUST CONFERENCE

Important Practical Matters Discussed

[The conference terminated just too late for this interesting account by a Canadian delegate to be included in the April issue.]

The Third International Wheat Rust Conference was held in Mexico City, Mexico, March 18 to 24, at the invitation of the Department of Agriculture of Mexico. Detailed arrangements for the Conference were made by an organizing committee, whose members represented a number of participating countries. The Conference owed its success in a large measure to the Office of Special Studies of the Rockefeller Foundation and its director, Dr. E. J. Wellhausen.

There were about 90 delegates present from eleven countries in the New World, besides Prof. C. Sibilia from Italy and Dr. I. A. Watson from Australia. The 11 Canadian delegates represented the Canada Department of Agriculture, the National Research Council, and the Universities of Manitoba, Saskatchewan, and Alberta.

The Conference was opened on March 19 by Ing. Jesus Merino Fernandez, Sub-Secretary of Agriculture, who represented Señor Gilberto Flores Muñoz, Secretary of Agriculture. The reply to the address of welcome was made on behalf of the delegates by Dr. José Vallega, Argentina.

The chief purpose of the Conference, as of its predecessors, was to review the progress of investigations on the rusts of wheat, with particular reference to international co-operation. The first of these Conferences was held in the United States, at St. Paul, Minn., in 1950, and the second in Canada, at Winnipeg, Man., in 1953.

Differential Test Plants

As the need for international co-operation in rust investigations arises mainly as a result of the high degree of physiologic specialization in the rust fungi, much of the discussion in the Conference and outside was devoted to this question. It was generally agreed that there is an urgent need for the adoption of a single system of designating the sub-races or biotypes that are being detected so frequently in many wheat-growing countries, and which cannot be identified by means of the standard differential hosts. For some time it has been the common practice to use supplementary differentials to identify sub-races, but as these have been selected independently by workers in different countries, it is sometimes impossible to know if the sub-races identified in one country are the same as those found elsewhere. It is now felt that the standard differentials should be retained, but that general agreement should be sought on the choice of supplementary varieties used to identify sub-races. The question of obtaining international agreement is to be studied by a representative group of plant pathologists.

The Term 'Biotype'

A number of workers expressed the view that the use of the term 'biotype' should be discontinued except in the sense in which it is used in genetics to designate a pure line of rust.

Pure Line Urediospores

The results of experiments reported from the University of Wisconsin suggest that studies of pathogenicity and the genetics of rust resistance may be greatly facilitated by the use of a simple technique of establishing pure-line cultures from single urediospores.

Excursions

In the afternoon of March 21 the delegates visited the National Agricultural College at Chapingo and the nearby laboratories of the Office of Special Studies, Rockefeller Foundation. A demonstration and discussion on preservation of rust spores by vacuum drying was given by Ing. Ruben Perez.

After an overnight journey by train, March 23 was spent at the La Cal Grande Experimental Station, La Piedad, Guanajuato. The tour of the station was conducted by Dr. N.E. Borlaug, who explained the wheat research programme under way. A large number of lines from many different crosses are under test for yield and resistance to wheat rusts. An important backcross programme is in progress with the varieties Yakui and Gabo with a view to developing a composite variety made up of a number of lines each one of which possesses resistance to one or more of the prevalent races or groups of races of rust. Although a composite variety may suffer some damage from rust there is little likelihood of its being wiped out by the sudden appearance of a new race, which would be unlikely to attack all the lines in the mixed population. The composite variety will, however, be uniform in agronomic characteristics and milling and baking quality.

Dr. Borlaug pointed out that, to obtain maximum yields from the new varieties of wheat which are being produced and grown in Mexico, it is necessary to introduce better cultural practices. For this reason, the Station at La Piedad is carrying out experiments on rotations, methods of cultivation and irrigation, and the use of fertilizers (the most important limiting factor in wheat yields has proved to be the lack of nitrogen). The introduction of improved varieties together with the adoption of better cultural practices and the greater use of fertilizers has already reduced Mexico's need to import wheat.

The Conference was formally closed on the evening of March 23 at La Piedad by Ing. Ricardo Acosta V., Director of Agriculture. Some of the delegates went on to Cuidad Obregon, Sonora, the centre of a new and important wheat-growing region where one of the international wheat-rust nurseries is located.

I.L. Conners

F R O M N E A R A N D F A R

For the further promotion of the study of wood technology, including wood preservation, the Institute of Wood Science has recently been formed in London with Mr. David D. Irwin, deputy chairman of the Timber Development Association Ltd., as chairman and honorary secretary. It is hoped to commence publication of a journal as one of its first activities. Enquiries re. membership should be made to the hon. sec., c/o Timber Development Association, 21 College Hill, London, E.C.4.

The Secretary of State for the Colonies has announced that the Government intends to create as soon as possible a pool of officers with high administrative or professional qualifications in the Overseas Civil Service for secondment to overseas governments.

List of Seed-borne Pathogens

Drs. Mary Noble, J. de Tempe, and Paul Neergaard have recently spent a week in conference at the C.M.I. preparing the final draft of the list for circulation.

Further Spread of South American Leaf Rust

In October 1955 maize rust (Puccinia polysora) was newly reported from Agalega Island in the Indian Ocean (C.P. NEWS, 1, p. 62) and this note is to record the occurrence of the disease in south-east Asia. Specimens of diseased maize leaves

sent to the Institute from Christmas Island, about 290 miles south of Java, were found to be heavily infected by the rust in the uredospore stage only. Two collections of maize material from North Borneo and several collections from Malaya were also heavily infected. Some of the specimens from Malaya bore uredospores smaller than usual but they showed the golden-yellow colour and thin wall typical of P. polysora. The examination of earlier collections kindly supplied by the Department of Agriculture showed that the fungus had been present in Malaya since 1950. Maize is a very minor crop in Malaya and no damage had been reported. Material from the north-western part of Malaya also bore uredosori of P. polysora so that the rust is widely distributed in the country.

In a note to Nature in October 1955 (Vol. 176, p. 655) H. H. Storey and A. K. Ryland recorded the occurrence of a new physiologic race of P. polysora which was encountered in routine testing of certain maize lines in glasshouses. R. H. Cammack has also recorded a new strain from Nigeria (C. P. NEWS, 2, p. 11). The rust from Malaya with its small uredospores may be yet another race different from the African ones and its pathogenicity to test varieties requires to be investigated.

Publications of Interest

A further volume of the bibliography of plant protection, covering the year 1951, prepared in German, English, and French by the Biologische Bundesanstalt für Land- und Fortwirtschaft in Berlin-Dahlem, has appeared, and comprises over 12,500 titles. It is published by Paul Parey, Berlin and Hamburg.

The Second General Catalogue of Latin American Mycological Collections, 1955, has been published by the Unesco Centre for Scientific Co-operation, Bulevar Artegas 1320, Casilla de Correos 859, Montevideo, Uruguay. It details all the collections of fungi and their disposal. Further information from the Centre for Co-operation.

"Notes on the Preparation of Illustrations" prepared by the Biochemical Journal is obtainable from the Lister Institute of Preventive Medicine, Chelsea Bridge Road, London, S.W. 1., for the very modest outlay of one shilling.

Curtis's Botanical Magazine has now completed a 282-page cumulative index of Vols. 1 to 164, which is made particularly valuable by the use of accepted contemporary names throughout. Price £2-2-0 from the Royal Horticultural Society, Vincent Square, London, S.W. 1.

C. M. I. Advisory Visit

At the request of the Nigerian Government Dr. J. C. F. Hopkins will fly to Ibadan to investigate the serious losses to the flue-cured tobacco crop caused by the tobacco leaf curl virus. He will spend two weeks in the territory and will consult with Dr. J. M. Waterston on future lines of research.

On his return, Dr. Hopkins will make a week's survey for the local government of the plant disease position in Malta.

Investigation of the inter-relationships of the whole environment and not merely of the pathogen and host was the theme of the 2nd INTERNATIONAL PLANT PROTECTION CONFERENCE organized by I. C. I. at Fernhurst from June 19th to 22nd.

The C. M. I. was represented by the Director and Dr. J. C. F. Hopkins. It is hoped to publish a short account in the October C. P. NEWS.

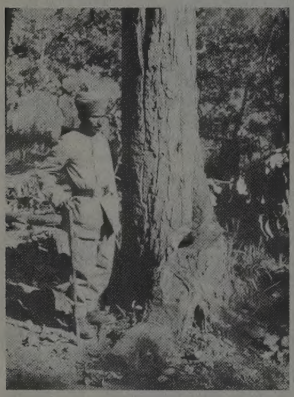
At the UNESCO General Conference at Montevideo much concern was expressed by many speakers that the lack of modern floras and other taxonomic works in many tropical countries was an insuperable hindrance to research in a great many fields. No doubt readers of C. P. NEWS are only too familiar with the frustration engendered by this deficiency.

From a recent letter, "..... black-leg symptoms appeared on the hose."

Forest Pathology Notes from India

B.K. Bakshi, Forest Research Institute,
Dehra Dun, India

At the Forest Research Institute, Dehra Dun, both tree diseases and timber decay are studied. These two aspects are often dealt with by distinct groups of workers in different laboratories, but the study of both at the same time gives a connected story of the health of a tree from the seedling stage to maturity, and then to its final conversion and utilization. The present note deals with the pathology of sal (Shorea robusta), one of the most important hardwoods in India.



Mortality and Unsoundness in Sal. In a recent survey of sal forests in western Uttar Pradesh it was observed that sal trees which have grown healthily for 60 to 70 years and have attained a height of about 60 ft. or more are dying from the top on a large scale in certain localities. In a few years such trees dry up completely. Consequently some sal forests prone to periodic mortality of this nature are managed under a moribund working circle where no green fellings are made but periodic dry fellings only are prescribed. No pathogen could be detected, but the soil profile showed an intervening layer of coarse sand mixed with small stones about 1 to 2 ft. thick, at 6 to 7 ft. depth, causing the roots to suffer a water deficit, the effects of which were first produced on the furthermost branches, resulting in a drying of the tops.

Fig. 1. (Above) An apparently sound green sal marked for felling. On axing, the central wood was found to be hollow. Fig. 2. (Below) Cross section of a green sal attacked by Fomes caryophylli. Note punk knots, 'eyes' and ring rot.

Unsoundness in sal due to fire or decay may occur at any age, and since the trees are fire-resistant only the heartwood is affected and they continue to grow to maturity enclosing the unsound wood. Most of these diseased trees can be detected from some external appearances and some noticeable symptoms are swellings on the stem, usually lower down, the presence of knots and epicormic branches at all heights, and a deformed crown. Such trees emit a hollow sound when struck at the base. Attacked trees also exhibit additional symptoms, which are specific for a given fungus and will be stated later.

Green sal trees marked for felling are classified according to soundness and growth but in certain localities, unsound trees present no reliable external symptoms so that correct classification is a problem (fig. 1).

Fire and fungi may cause unsoundness independently or in conjunction, the former, particularly, in forests of the drier type, where it is of regular occurrence.

Fire, suppression, and frost are the main contributory factors to the incidence of unsoundness in sal caused by fungi. Fire causes wounds through which heart-rot fungi gain entrance into trees. In a crop of mixed age worked under the selection system suppression occurs in the understory in spite of the fact that the overhead canopy is adjusted, rendering the young trees susceptible to fungus attack to which dominant trees are resistant. In frosty localities, opening the overhead canopy to a large degree to avoid or reduce suppression exposes

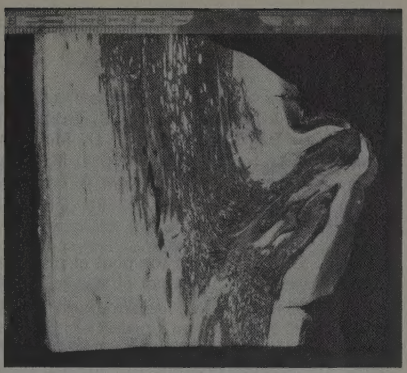


Fig. 3. A green sal cut lengthwise to show white pocket rot in heartwood due to Hymenochaete rubiginosa which enters through a branch stub on which sporophores of the fungus form.

the young crop to frost damage, resulting in cankers which form favourable places of ingress for wood-destroying fungi.

Important fungal pathogens causing 'white rot' in the wood are Fomes caryophylli and Hymenochaete rubiginosa, the former attacking sal of all ages, though young trees between 15 years (when heartwood begins to form) and 30 are most susceptible. Infection occurs through branch stubs, knots, arrested laterals, and frost cankers, symptoms including the presence of numerous hard, black, round, structures about 1·5 cm. broad fitted as sockets in the healthy bark. These 'eyes' are terminations of punk knots, which consist of decayed wood and mycelium and stand out sharply from the adjoining healthy wood (fig. 2). Sometimes the 'eyes' are overgrown by the bark, and only small swellings occur at these regions. Sporophores of F. caryophylli are rarely formed on the host, dissemination occuring mainly by means of conidia which develop on the punk knots exposed on the bark. Decay is restricted in the heartwood but sometimes may extend into the sapwood and appears in cross section in the form of spongy rings (fig. 2), for which the term 'ring rot' may be applied. Hymenochaete rubiginosa attacks sal mainly through fire-scars and branch stubs on which the sporophores of the fungus develop frequently. The wood becomes dark brown and spongy and pockets are formed (fig. 3).

To reduce the incidence of unsoundness, all trees which exhibit symptoms should be removed during thinnings and selection fellings. It may be possible after a critical study of the external symptoms of the unsound trees to suggest pathological marking rules based on external symptoms. Decayed stumps should not be allowed to coppice to prevent the fungus passing to the new shoots. Control burning should be practised in order to avoid fire damage. The forests should be managed under sound silvicultural lines to avoid frost and suppression.

Notice of Plant Protection Congress

The fourth International Plant Protection Congress will be held in Hamburg, Germany, from the 8th to 15th September, 1957. Any readers who require further information should write to Prof. Dr. H. Richter at the Biologische Bundesanstalt für Land- und Forstwirtschaft, Braunschweig, Germany, Messeweg 11-12.

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PERSONAL NEWS

Visitors to C.M.I.

Among overseas visitors to the Institute were, B.J.T. Baldwin, Uganda; Dr. J. de Tempe, Netherlands; Mary E. Elliott and Doreen E. Wells, Canada; M. Ishaque, E. Pakistan; Dr. A.P.D. McClean, S.Africa; Dr. Paul Neergaard, Denmark; Dr. L. Nilspar, Sweden; M. Nour, Sudan; Dr. K. Prakob, Thailand; M. Md M. Shariff, W. Pakistan; A.L. Wharton, W.A.C.R.I.

"Pool" News

Dr. B.E.J. Wheeler, of the pool of plant pathologists, has completed his field investigation of the leaf spot of tobacco in Nyasaland caused by Alternaria longipes and has returned to C.M.I., where he will continue ancillary laboratory work.

R.A. Altson has returned from Sarawak and also assumed duty at C.M.I.

Appointments, Transfers, and Retirements

The Overseas Service Division of the Colonial Office announce the following appointments: C.C. Webster, deputy director of agriculture, Malaya; W.H. Edwards, E.J. Gregory, and D.G. Jones, assistant directors of agriculture, Uganda, N.Region, Nigeria, and Tanganyika, respectively; L.N.H. Larter, chief research officer, Malaya; H.A. Darley and P.E. Osborne, chief agricultural officers, Jamaica and L.E. Luscombe, Nyasaland, respectively; J. Bowden, principal specialist, Gold Coast; and C.L.M. van Eynatten, plant breeder, Maize Rust Research Unit, Nigeria.

Dr. W.G. Keyworth, National Vegetable Research Station, Wellesbourne, has been appointed a recognized lecturer to the botany department, Birmingham University.

Dr. James Melville, director of grasslands division, D.S.I.R., New Zealand, has been appointed director of the Waite Institute in succession to Prof. J.A. Prescott.

Dr. Paul R. Burkholder, head of the bacteriological department at the University of Georgia, who is well-known for his work on bacterial plant pathogens and his discovery of chloromycetin, has been appointed director of research at the Brooklyn Botanic Garden, New York.

Dr. Anthony Michaelis has succeeded Mr. W.E. Dick as editor of Discovery.

Awards

The following honours have recently been conferred, G.V.B. Herford, Pest Infestation laboratory, D.S.I.R. and J.E. Peat, Empire Cotton Growing Corporation (C.B.E.); H.S. Bushell, Commonwealth Institute of Entomology, A.H. Lewis, director, I.C.I. research station, Jealott's Hill, and J.F. Malcolm, bacteriology department, West of Scotland Agricultural College (O.B.E.).

Dr. R. Markham, of the Plant Virus Research Unit, Cambridge, has been elected to the fellowship of the Royal Society.

The Linnean Gold Medal for 1956 has been awarded to Prof. W.H. Lang, emeritus professor of cryptogamic botany, Manchester University.

Leverhulme research awards for 1956 have been made to P.R. Bell, lecturer in botany, and Dr. K.A. Kermack, lecturer in biological statistics, both of University College, London.

Honorary fellowship of Imperial College of Science and Technology, has been conferred on Profs. William Brown and J.W. Munro.

Lennart Holm, Institute of Systematic Botany, Uppsala University, is the first European to be awarded a graduate fellowship of the Mycological Society of America (1956-57). He will study Ascoloculares.

OBITUARY

Dr. C.L. Shear, the distinguished American mycologist, died in February of this year.

OVERSEAS NEWS

NOTES FROM CANADA

Conferences: Potato Investigations in South America

European Visit. Dr. A. J. Skolko, assistant chief, Botany and Plant Pathology Division, Canada Department of Agriculture, will attend the Ninth International Seed Testing Convention at Paris, June 4 to 9, 1956. Dr. Skolko is chairman of the Committee on Plant Diseases. He also expects to visit plant pathology institutions at Wageningen and Baarn, and round about London.

South American Seed-Potatoes. Dr. D. J. MacLeod, officer in charge, Plant Pathology Laboratory, Fredericton, N. B., was a member of a recent Canadian mission, which, at the request of the local government, investigated the problem of potato production in Venezuela, to which Canada supplies the bulk of the imported seed potatoes. It was suggested that the late blight-resistant varieties developed in recent years in North America should replace the varieties now imported, and that more attention should be paid to the use of protectant sprays. It is of interest to note that fields of Canadian seed were remarkably free from virus diseases.

At the conclusion of the mission Dr. MacLeod spent several weeks in Peru. He was greatly impressed by the fine work being done at La Molina Experiment Station, near Lima, in improving the yields of the native sorts of Solanum andigenum, some high-yielding varieties having been obtained by selection and breeding. He also visited the Experiment Station at Puna, where both indigenous and foreign potato varieties are being tested. The highlight of his trip was a visit to Prof. Cesar Vargas, Professor of Biology, at the University of Cusco, who has been making notable contributions to the taxonomy of the Solanaceae.

I. L. Conners

AUSTRALIAN NOTES

Speeding Up Banana Bunchy Top Eradication. A recent advance made by B. M. Braithwaite, Entomologist, in developing ground spraying with dieldrin to replace poison-baiting for the control of beetle borer in banana plantations offers an opportunity of accelerating bunchy top eradication in New South Wales. Progress in eradication has been slower in recent years because of the difficulty of finding the relatively few infected plants which occur each year; nevertheless, the cost of searching for these plants remains high. The high persistence of dieldrin in the soil is a special advantage and allows consideration now to be given to measures aimed at restricting the vector aphid (Pentalonia nigronervosa) as well as the virus, the latter having been the basis of earlier action. Trials have been commenced to determine the rate and concentration of dieldrin, which as a single winter application will maintain control of the vector and its attendant ants. When this is accomplished inspections of infected plantations can be spaced at wider intervals.

Flood and Phytophthora Damage to Citrus in the Hawkesbury Valley, New South Wales. Dr. Lilian R. Fraser gives the following account of a recent calamity and mass infection by P. citrophthora:-

During February and March two high floods within a fortnight, a number of minor floodings, and almost continuous rain for a period of 6 weeks occurred in the Hawkesbury Valley. This area had suffered severely in the 1949-52 seasons and over 100,000 citrus trees had been destroyed. New plantings had gone on since then and 36,000 acres of young trees, almost all on trifoliata stock had been established and were in a flourishing condition at the time of the recent flooding. Many of these have now been destroyed, some by scouring, some overwhelmed by mud and debris, but most by Phytophthora citrophthora attack on

foliage and branches. Trees which were under water for more than 24 hours lost all leaves and fruit due to Phytophthora attack, and branch infection, facilitated by the subsequent wet weather, has been continuous; some trees in lower areas have been standing in water for over 4 weeks. It is presumed that following the first flood zoospore formation on the waterlogged soil surface was intense, and the second flood, which though not so high as the first caused more damage, was therefore loaded with infective material. The damage has been greatest in backwaters.

It is noteworthy that citrus trees in the Narromine district which last summer were submerged by the waters of the Macquarie River for up to 6 days suffered little or no Phytophthora damage to foliage and branches. These flood waters, passing through pastoral country before reaching the orchard area, would be uncontaminated by the pathogen.

Visit of James G. Horsfall. Plant Pathologists in New South Wales recently enjoyed a brief visit from Dr. Horsfall and were able to extract from him a first hand account of the history of development of the dithiocarbamate group of fungicides. Thiram, maneb, ziram, and zineb are now commercially established in New South Wales and as formulations improve are bound to appear in nearly every officially recommended protective programme.

C.J. Magee

NEW ZEALAND NOTES

New Society Meets. The first Annual Meeting of the New Zealand Microbiological Society was held on the 14th and 15th May in Wellington. The constitution was adopted and the officers elected were Mr. J.O.C. Neill, President; Dr. Harry Jacks, Vice-President; Dr. Harvey C. Smith, Secretary-Treasurer; Dr. R.H. Thornton and Dr. J.C. Gibbs, Committee members. The next annual Meeting will be held at Massey College, Palmerston North.

Antirrhinum Rust Seed-borne. Mr. R. Close of the Plant Quarantine Section of the Department of Agriculture has shown that viable antirrhinum rust spores were present in antirrhinum seed imported from England. This evidence also confirms C.J. Magee's thoughts [C.P. NEWS, Vol. 2, pt. 1, p. 9] regarding the unlikelihood of long distance aerial spread.

Perfect State of Phoma lingam. I have recently collected numerous perithecial specimens of a Leptosphaeria sp. on the remains of the previous season's swede and choumoellier crops in the south of New Zealand, in paddocks where dry-rot (Phoma lingam) was prevalent last season and is again severe this year in the succeeding swede and rape crops. Single ascospore cultures from three different collections have been made and are morphologically identical with Phoma lingam in culture and on the host, where they have produced typical dry-rot infection on swede leaves and bulbs. The season was very dry during the summer and possibly very favourable to the production of the perithecial stage.

A Correction. C.P. NEWS, Vol. 1, pt. 1, p. 11, Anthracnose of lupins. The causal fungus is Ascochyta pisi, not Glomerella cingulata. Extensive inoculation tests on all species of lupins at the Crop Research Division failed to show any with resistance to this stem canker disease.

Harvey C. Smith

NEWS FROM INDIA

Abnormal Germination of Teleutospores of Sann-hemp Rust (Uromyces decoratus). When the temperature conditions are not quite favourable for the normal germination of the teleutospores of material collected this year at Delhi, sometimes the sporidia show a tendency to produce "secondary" sporidia while still attached to the promycelium; at times a continuous chain of 3 to 4 may be formed, which

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POOLE ENGLAND

generally get disconnected from the chain during the process of mounting. The appearance of "secondary" sporidia has been observed by de Bary (1853), Tulasne (1854), and others. Bessey (1952) has recorded that under conditions of extreme humidity the "primary sporidia and the succeeding ones of Kunkelia nitens (Schw.) Arthur, remain attached in chains of four or five successive smaller cells".

In one case a single teleutospore was found to produce two promycelia, which, however, remained sterile. Sometimes the promycelia became two to three times longer than normal. These promycelia also remained sterile, though in a few cases rudimentary sterigmata were formed.

Yellow Rust of Wheat (Puccinia glumarum). The outbreak of yellow rust during 1955-6 has been fairly early and widespread, resulting in considerable damage to the wheat crop in northern India. Some of the varieties like C 250, C 228, C 281, C 518, and NP 718, which in previous years showed little rust, were very severely affected, while NP 710 developed very little infection this year all over the country. Analysis of the race flora of the rust, however, did not show any change, race A being predominant, followed by race 19.

Black Rust of Wheat (Puccinia graminis tritici). A new biotype of race 21 was isolated from the parent race on the basis of its pathogenicity on three additional differential wheat varieties, and was found to be present in widely separated localities.

New Records of Fungi in India. Five new genera namely Starkeyomyces koorchalomoides Agrihothrudu, Lomachashaka kera Subramanian, Psathramaya sundra Subramanian, Prathoda sparya Subramanian, and Tharoopama trina Subramanian were recently reported from south India, and 15 new species were recorded from different parts of the country.

Sugar-cane Rust (Puccinia kuehnii). This disease, which was first reported on sugar-cane on Co. 475 in India in 1950, is gradually assuming increasing importance. Up to the present it has been considered to be restricted to south India only and had been observed on Co. 876 and Co. 928 in Nellikuppam area in Madras and on Co. 475, Co. 421, Co. 467, Co. 603, Co. 658, Co. 732, and P.O.J. 2878 in Hyderabad Daccan. Recently a severe outbreak was observed in Gola Gokaran Nath area (Uttar Pradesh), which lies in the heart of the main cane-growing belt of northern India. The rust appeared in epidemic form on a newly-released commercially important variety Co.S. 510, which occupies an area of about 5,000 acres. The infection was particularly heavy on the September-sown crop and affected fields gave the appearance, of having been burnt. Light infection of Co. 313 and Co. 443 was also observed.

R.S. Vasudeva

NOTES FROM THE SUDAN

Leveillula taurica on Cotton. In December, 1955, young Gossypium barbadense and G. hirsutum plants grown out of season for breeding tests (by the Empire Cotton Growing Corporation) in Shambat, Khartoum Province, were found to be infected with L. taurica, this being the first record of the disease in the Sudan on cotton. It was widespread on several American and Egyptian cottons, affecting the cotyledons and young leaves with marked purplish symptoms on the lesions. The conidia produced are large (48-80 × 14-20 μ), so the parasite is not Oidiopsis gossypii f. indica. No perithecia were observed, as is the case with almost all infections of L. taurica under tropical and sub-tropical conditions.

From tests done afterwards it has been shown that the infection must have come from weeds, e.g. Eurphorbia heterophylla. Cross inoculation tests have demonstrated that the parasite can be transferred between the Gossypium spp. and from several weeds and Vicia faba to the cotton varieties and vice versa.

Although the appearance of this disease on cotton was viewed with much concern, since it may spread southward into the Gezira, the largest cotton producing unit in the Sudan, the disease appears to be of a mild nature and the infected cotton

plants grew out of it with little or no damage. Full details of the tests, symptoms, etc. will be published elsewhere. Collections of all the infected cotton varieties, have been deposited at the C. M. I. Herbarium.

Control of Powdery Mildew Diseases in the Sudan. Several fungicides were tested for the control of powdery mildew diseases on Sudan crops. They were, (i) special spreading sulphur dust, (ii) lime-sulphur (sulfinette), (iii) spersul, (iv) tulisan, (v) perenox, all obtained from I. C. I., and tested on broad bean (Vicia faba), okra (Hibiscus esculentus), and pumpkin. Complete control was obtained from applications of the first four fungicides. L. taurica on broad bean and cotton was effectively controlled by application of 40 lb of S. S. S. or 80 to 100 gallons of 1 in 100 dilution in water of sulfinette per acre every three weeks after the first appearance of the disease. Neither crop showed sulphur shyness or after-effects as a result.

M. A. Nour

NOTES FROM AFRICA

Unusual Disease in Uganda

A disease of tobacco seedlings has become increasingly important during the last three years in the Gulu area of northern Uganda. When it first appeared is not known with certainty, but more and more seed-beds have been affected each season after the onset of the heavy rains in March, although beds are sown progressively from January onwards.

The disease simulates damping-off, and whole beds may be destroyed during hot spells with frequent showers and a high atmospheric humidity. The first symptoms are watersoaked spots, usually at the distal end of the lower leaves, but they may appear on any leaf in any region. The spots enlarge and dry out rapidly, giving the leaves a papery texture, and causing a darkening of the vascular tissues of the petioles and collar region of the stems. Plants less than six weeks old die rapidly, but in larger seedlings the spots remain localized: so far the disease does not seem to have progressed after transplanting in the lands.

A bacterium isolated from typical lesions produced the same symptoms when sprayed on to tobacco seedlings in a glasshouse, and the bacterium was re-isolated. It has been identified as Pseudomonas solanacearum var. asiaticum by Dr. W. J. Dowson, and experiments are in progress at Cambridge to test its ability to cause a wilt.

Experiments with fungicides, including streptomycin, on seed-beds have been started at Gulu.

B. J. T. Baldwin

Tobacco Diseases

WITH SPECIAL REFERENCE TO AFRICA

BY

J. C. F. HOPKINS, D.Sc., A.I.C.T.A.

Commonwealth Mycological Institute, Kew, Surrey, England
formerly Chief Botanist and Plant Pathologist, Southern Rhodesia

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NOTES FROM SCOTLAND

Change of Quarters. The Plant Pathology Branch of the Department of Agriculture for Scotland has moved into other quarters near to the Seed Testing and Plant Registration Station, of which main station it is still a part. In the new quarters it will be more directly in liaison with the Plant Entomology/Helminthology and Food Infestation branches which have buildings near to it. Apart from the usual routine and consultative functions of a government scientific unit, active research is being pursued on the incidence, spread, and commercial control of potato virus diseases, seed-borne diseases of cereals, grasses, etc., an improved glasshouse test for resistance to club-root and various potato tuber diseases such as gangrene, skin spot and blackleg.

Convenient Seed Germinator. Of topical interest is the more efficient and rapid determination of certain seed-borne pathogens by the use of perspex germinators to replace the standard "Copenhagen" or "Jacobson" type used in routine seed testing. This latter apparatus consists of a large metal water tank, usually three feet or so square. Glass strips placed across the tank carry small round pads of blotting paper, kept moist by a wick which passes between the strips of glass to the water. The pads are covered by individual ventilated bell-jars.

The specially-designed perspex germinator is illustrated in fig. 1 with the old type in the background for comparison. The main advantages of the new type are the speed with which the seed can be put on the paper for testing and with which it can be examined under a low-power binocular microscope. For this purpose a specially designed shallow tray made of polyvinyl chloride (PVC) supports the plate and wicks, so keeping the stage of the microscope dry and allowing lateral movement which can be supplemented, if the stage is of the type illustrated, with finger operated movement in two directions. The perspex germinators are easily portable and can be stacked as shown in the background of fig. 2; furthermore, it is understood that perspex allows more ultra-violet light to pass than does glass, an advantage when working with fungi which require ultra-violet rays for spore formation. Certainly, Helminthosporium spp. on grasses and cereals form spores quickly under these conditions. It has proved convenient with some seeds, such as flax, to suppress germination by adding a little 2,4-D to the water in which the paper pad is dipped. It adds considerably to the convenience of examination not to have projecting plumules obstructing the view of fungi developing on the tests.

The "labels" fixed to the side of the dish visible in the background in fig. 2 are xylonite, on which the reference numbers, dates, etc. can be marked in pencil and subsequently rubbed out. Between each test the dishes and plates are washed in water then rubbed over with methylated spirit.

C.E. Foister
East Craigs,
Edinburgh.

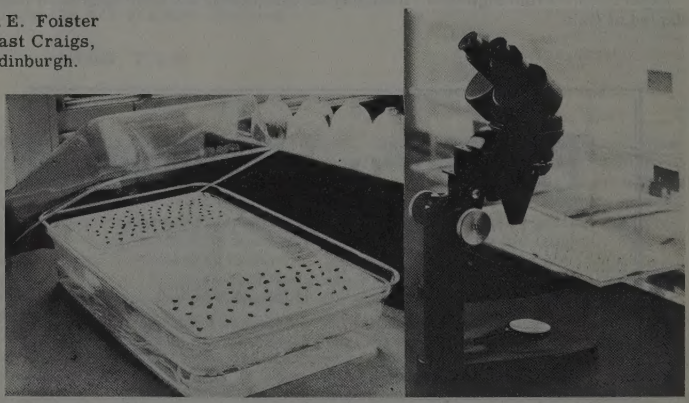

Fig. 1. (Left) Perspex germinator for seed pathology work. "Copenhagen" type in background. Fig. 2. (Right) Individual plate from perspex germinator on tray. Stacked germinators with labels in background.

NEW BUILDING AT ROTHAMSTED EXPERIMENTAL STATION

View from the East of the new building at Rothamsted Experimental Station, Harpenden, Herts.

The considerable expansion in the biological departments at Rothamsted since the war has recently culminated in the opening of the new 'West Building'. This was occupied in June, 1955, by about 80 of the staff, comprising the whole of the Insecticides and Fungicides department, the Entomology department and the mycologists of the Plant Pathology department. The building, which is a reinforced concrete shell faced with red brick, has a pleasing modern aspect, and the long low front is emphasized by the bold use of glass, the windows being continuous along the entire length. The architects are Messrs. Cowper and Poole. The research laboratories all open to corridors which run the whole length of the two-storey central block and two single-storey wings. The sizes of the rooms, the bench fittings, and other furniture have been designed to meet the needs of individual research workers, but standardization of materials (teak benches, movable under-bench cupboards, and glass-fronted wall-cupboards) allow for any adaptations that may become necessary. Photographic dark rooms and chemical store-rooms are among the many "extras" which are shared between the departments in the building. Six constant-temperature rooms, with equipment for growing plants under different environmental conditions, are now near completion.

The Insecticides and Fungicides department occupies the whole of the North wing and the North ends of both floors of the central block. The South wing and the rest of the ground floor houses the Entomology department, which had previously been accommodated at Rothamsted Lodge and in the out-buildings of the Manor House. Part of the upper floor is taken up by a library, which contains the books and journals directly related to the departments in the building. The rest of this floor is occupied by the mycologists of the Plant Pathology department. The mycologists are working on problems of spore-trapping, potato blight forecasting, club-root of crucifers, cereal footrots, skinspot of potatoes, Fusarium diseases, and variability in Fusarium.

The movements involved in occupying the West Building have, of course, affected the rest of the 400 staff of Rothamsted, who now have much more breathing space in their redesigned and expanded laboratories in the older buildings. Here, the Plant Pathology department (virus research workers), the Botany department, and the Administrative staff have all been given extra space.

LATE NEWS

Dr. C.C.V. Batts has been appointed lecturer in plant pathology in the Department of Botany and Plant Technology of the Imperial College of Science and Technology, London. He will be responsible for developing a post-graduate course in plant pathology in the coming academic year.

A new publication by Grace M. Waterhouse entitled "THE GENUS PHYTOPHTHORA", diagnoses (or descriptions) and figures from the original papers has just appeared and is obtainable from C.M.I., price 15s., post free.

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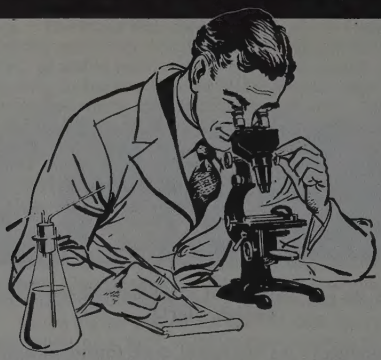

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